

Beginner's Guide to Home Canning

by Frances Reasonover

Canning is probably the most economical and practical method of preserving food at home. Among other things it is a way to save food that otherwise might be wasted.

Cost of home canning depends on the kinds and sources of food canned as well as the processing methods, containers, and equipment used. Other cost factors—labor, energy, water and added ingredients—make exact cost figures impossible to apply generally, but studies are reporting averages that show canning to be economical.

The wise homemaker will can only the amount to be used within a year. Food held longer will be safe to eat if it has a good seal and no signs of spoilage, but there may be nutrient or quality loss, especially if stored at temperatures above 70° F.

As a beginner canner you need to know something about micro-organisms, including yeasts, molds and bacteria, on the food, in water, air and soil, as causes of spoilage in foods. Knowing about these minute forms of life, which are so abundant everywhere, will help make the work safer as well as more interesting.

In addition to the action of these minute organisms, the spoiling of fruits and vegetables is hastened by natural changes in color, flavor and texture of the food. These changes result from the action of enzymes or micro-organisms found in nature which break down and decompose foodstuffs.

Bacteria are the most serious foes to combat in canning because they are more difficult to kill by heat than either molds or yeasts.

Acid in canned food is expressed

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as pH value. Foods having a pH of 4.5 or lower are called high-acid foods and those with a value of 4.6 or higher are termed low-acid foods.

Since few bacteria thrive in acids, their destruction is less difficult in fruits than in vegetables (with the exception of tomatoes).

Botulism is a deadly poison caused by a toxin from the growth of spores (seeds) of the bacteria, *Clostridium botulinum*. These spores will produce a deadly toxin in low-acid foods in the absence of air (oxygen) inside a sealed jar. Therefore, the spores must be destroyed by processing under pressure at 240° F. The length of time has been determined by scientists for each individual food.

Clostridium botulinum will not grow in foods with a pH of 4.5 or lower, so high-acid foods may be processed safely in boiling water at 212° F.

Low and High Acid Foods

Low-acid vegetables	High-acid fruits and vegetables
Asparagus	Apples
Beans—snap or shelled	Apricots
Beets	Berries
Carrots	Cherries
Corn	Grapefruit
Potatoes	Peaches
Pumpkin	Pineapple
Squash	Rhubarb
Sweet potatoes	Tomatoes

Yeasts, mold and non-spore forming bacteria are readily controlled by processing at 212° F.

Most canning equipment and supplies may be purchased at hardware stores, housewares departments, and from mail order companies. Jars and lids are available in many retail stores.

Canning Jars

Select standard canning jars made of tempered glass that can withstand high temperatures. The manufacturer's name or symbol in glass will identify the product. With careful handling, jars last an average of about 10 years. Avoid using antique jars because there can be hair-line cracks not visible to the eye, causing jars to break.

Use canning jars in sizes suitable for the product canned and your family's needs. Canning jars generally are sold in half-pint, pint and quart sizes with wide and narrow mouths. Large-mouth jars are convenient for packing such foods as whole tomatoes and peach halves. Quart jars are convenient for vegetables and fruits where your family has four or more members.

Examine the sealing edge of jars for nicks, cracks, or sharp edges that would prevent a seal. Discard any with these imperfections.

One-trip jars from purchased canned foods should not be used because they generally are not tempered to withstand the high heat required for home canning, and may break when subjected to the heat. Tops of these jars may not fit standard canning lids, thus preventing a good seal.

Closures—jar lids and rings come with new canning jars. The sealing

compound of lids recommended for one use only will not hold a seal effectively after the first use.

Select lids appropriate for the jars being used. You may find the two-piece units (flat lid with sealing composition and ring), one-piece lids, or flats with separate gaskets made of metal or plastic. Always follow the instructions for pretreatment as indicated on the box or container by the manufacturer. If no name is indicated on the lid, use a black wax marking pencil or crayon and mark the identity on each lid. If there are problems, contact the manufacturer whose name and address is on the box or container.

Screw ring bands may be reused if kept clean and dry in a protective container with a tight-fitting lid. Never use bands with rust, or pried up or bent edges.

If you have extra lids, store them protected in a dry, cool place.

One-piece zinc caps lined with white porcelain, with rubber rings, may be used. The caps may be reused if they have not cracked, spread or bent at the edges and are clean, like new. The rubber rings are effective only once because they tend to dry and deteriorate with age, often become porous, and sometimes crack.

If you have jars with bail wire clamps, sometimes called "lightning"-type jars, be sure they are not in the "antique" class. Lids for these jars are all glass, and rubber rings are used between the jar and lid for sealing. A wire clamp holds the lid in place during processing; after processing, the short spring wire of the clamp is snapped down to complete the seal.

A boiling water bath canner is needed for processing high-acid foods, such as fruits, tomatoes, tomato and fruit juice, and pickles.

Water bath canners in several sizes are available on the market. The container must be deep enough for a rack



Home canning equipment.

to hold the jars off the bottom of the canner. The depth allows water to be over the jars of food by at least 1 to 2 inches. Keep 1 to 2 inches of space above the water to allow for boiling; this prevents water from boiling over.

The canner must have a tight-fitting lid. Or you can use a large kettle with a tight-fitting lid, and a wooden or wire rack to hold jars off the bottom. There should be free circulation of water to every part of the surface of the jar and lid.

If you are going to buy a water bath canner, check the height, and the lid to be sure it is tight-fitting. The rack preferably should have dividers so jars will not touch each other or fall against the sides of the canner or each other during processing.

A steam pressure canner is absolutely essential in canning low-acid foods, such as vegetables, and insures the destruction of spoilage micro-organisms.

Ten pounds pressure is used for processing food in standard canning jars at sea level. This pressure corresponds to 240° F.

The steam pressure canner is made of heavy metal that withstands high pressure developed by steam. It consists of a kettle with a tight-fitting lid equipped with an accurate weight or dial gage to register the pounds of pressure in the canner. The lid must lock or seal to prevent escape of steam.

The canner must have a safety valve, petcock or steam vent that can be opened or closed to permit exhausting (venting), and a pressure gage. It must have a rack to hold jars at least ½ inch from the bottom of the canner.

A dial gage indicates pressure on a numbered instrument.

A weighted gage has no dial, but automatically limits pressure with weights preset for 5, 10, and 15 pounds pressure.

The pressure is adjusted for high



Scalding tomatoes in a blancher.

altitude. For information on canning at altitudes above sea level, see the later chapter by Carole Davis.

To insure the canner's proper working condition, check the dial gage for accuracy each year—or if a canner or lid has been roughly handled or dropped, the dial gage glass broken, or any parts are rusty. The manufacturer or your county Extension office can give information on testing availability. Study and follow the manufacturer's directions for using your pressure canner.

Run through the process of operating the pressure canner on your range in a trial run before you get into the canning season, to be sure everything is working properly. Make a note of the dial setting of the range if you use an electric range for holding pressure steady.

Trying to use a pressure canner obtained from garage, rummage, or auction sales or handed down to you from someone's attic may prove dan-

gerous. You may not have any idea as to the care, handling, or storage of the canner. A manufacturer manual on care, use and replaceable parts usually is not available. Old-old canners did not have complete information—manufacturer's name, address or model number—on the appliance.

General kitchen equipment is helpful in any needed washing, peeling, coring and slicing in the preparation of fruits and vegetables. Examples are, a vegetable brush for cleaning vegetables, a blancher or wire basket for scalding fruits and vegetables such as tomatoes and peaches to loosen skins for peeling, and a colander for washing delicate fruits such as berries.

A food mill is handy for making purees and straining fruits for making juices, and a strainer for straining juice. A long handled fork or plastic spatula aids in fitting and packing food and removing air bubbles. A wide-mouth funnel is very convenient for filling jars, and a jar lifter helps you avoid burns in handling hot jars. Use an automatic timer to time processing accurately.

The number of pints of preserved food you will get from a given quantity of fresh food depends on the quality, variety, and maturity of the fruit or vegetable; on the size of the pieces, and on the packing method used.

Selection of good sound fruits and vegetables is of paramount importance. The quality of canned fruits and vegetables will be no better than quality of the raw food used. For best flavor retention, preserve only those vegetables that are young, tender, and freshly gathered.

Work Fast

All steps, from beginning to end, of any lot of canning should be carried through as rapidly as possible. A good slogan is "two hours from harvest to container".

Work fast with small amounts of food at a time, especially vegetables with high starch content such as corn and peas which lose quality rapidly. Any delay will result in loss of flavor and nutritive value.

Sorting and grading should be done very carefully, according to size and degree of maturity and ripeness.

Use only uniformly well-ripened products. Discard all defective products and use together those of the same size.

Dirt in seeds, bits of food, or sirup contains bacteria that is hardest to kill, and encourages yeasts and molds to grow on the outer surfaces. Wash fruits and vegetables thoroughly before canning.

Scalding, peeling and coring—some fruits, such as peaches and tomatoes, are scalded in order to peel them smoothly.

Follow up-to-date recommendations, available in U.S. Department of Agriculture or Extension publications, for detailed procedures in preparing fruits and vegetables for canning.

Packing Methods

You can pack food hot or raw in jars. Hot-packed food is heated thoroughly before it is packed into jars. Raw-packed food is placed raw in jars. Watery and soft foods such as tomatoes are pressed gently to make their own juice.

Air, a poor conductor of heat, should be removed from the jar. Remove air bubbles by gently moving the blade of a plastic spatula or plastic knife around the jar—being careful that the food is not broken. Add more boiling liquid if necessary to get a proper fill.

When filling jars, you will find the jar-filling funnel easy to manage. This makes it possible to avoid spills of seeds, bits of food, or sirup that could prevent sealing. But even when using a funnel you still need to wipe the jar rim.



Prepare the lids and sealing of jar according to the manufacturer's directions. When using a flat metal lid, place the composition side on the rim of the jar. Add the ring band and screw it down until firm, but not hard enough to cut through the sealing compound. The lid will have enough "give" to let air escape during processing. This is called venting and means heating to remove air from jars.

When using porcelain-lined zinc caps, fit the wet rubber ring on the jar shoulder, but do not stretch it more than necessary. Screw the cap firmly and turn it back $\frac{1}{4}$ inch.

Use a jar lifter or tongs and place the filled jars on the rack in the canner. Fill and place jars in the canner one at a time to keep jars as hot as possible while filling the canner.

Water Bath

Before you begin preparing the food, fill the water bath canner half full of hot water. This permits water to heat while you prepare the food. Put a large kettle or teakettle of water on to boil. The water should be boiling when hot-pack food is put into the canner.

Place raw-pack jars in water that is hot (180° to 190° F), just below boiling. Then bring it to a boil after adding jars.

As the rack of jars is lowered into the water, the water level will rise. If more water is needed to have the jars completely covered by 2 inches of water, add boiling water.

Prepare only enough jars of food at one time to fill the canner. Work rapidly, allowing as little time as possible between filling and closing the jars and getting them into the canner.

Start counting processing time as soon as the water in the canner reaches a gently rolling boil. Put the lid on the canner. Set your timer or clock and make a written note of starting time and final time. Keep the water boiling all during the processing period. If water boils down, add boiling water sufficient to keep it at the required height. When pouring water, avoid letting it hit tops of the jars.

Process for the recommended length of time. Do not cut processing time.

Pressure Canner

Follow the manufacturer's directions for operation of your pressure canner before, during and following processing. Supplement these directions with information in U.S. Department of Agriculture or Extension publications.

Count processing time as soon as the pressure reaches 10 pounds or the proper pressure adjusted for altitude. Be sure to hold pressure steady.

At end of the processing time, remove the canner from the heat. Allow the canner to cool until the gage registers zero to avoid breakage of jars and loss of liquid from jars. After a minute or two, open the petcock

Heating beons thoroughly before placing them in jars. Here, cut beons are covered with water to be followed by five minutes of boiling.

gradually and remove the cover. If a weighted gage is used, nudge the weight slightly. If no steam escapes, pressure is down. Tilt the far side of the lid upward so steam escapes away from your hands and face. Because food in the jars may be boiling vigorously, leave jars in the canner about five minutes and then remove them.

After Processing

When you remove hot jars from the canner, use a jar lifter, or protect your hands with cooking mitts, pot holders or canvas gloves. Set the jars upright to cool on a rack, such as a cake rack, or a bread or cutting board, with double layers of dry cloth or newspapers beneath the jars. If jars are placed on a cold surface or wet cloth, the difference in temperatures may cause the glass to crack.

Avoid placing jars in a draft, but leave two or three inches between them so air can circulate freely. Avoid further tightening of lids that have sealing compound, since this usually breaks the seal—unless the lid manufacturer states it is safe to tighten.

If your processing temperature was not held steady and liquid boiled out in processing, do not open the jar to add more. Leave the sealed jar just as it is.

Do not cover jars because this slows down cooling and food continues to cook. If you have an air conditioning vent that will direct cold air on jars, cover the vent during this canning session.

After 12 hours, check the seals. The vacuum may cause a loud snap of the two-piece vacuum seal while it cools, which is an indicator of an airtight seal. If the center of the lid holds down when pressed and the lid does not move, it is sealed.

Tap the center of the lid with a spoon—a clear, ringing sound indicates a good seal; a thudding sound indicates the possibility of an imperfect seal.

If there is a sealing failure, you will need to reprocess the jars. Remove the lid, heat the food and liquid, fill a clean jar and use a new lid. Process the full length of time. If only a few jars did not seal, you may elect to refrigerate and use the food within a day or two or freeze it.

Once the jar is sealed, allow it to set until cold. Then remove the screw ring band, wash and store in a dry place for reuse. For safety make a routine check of canned foods each month.

Label and Inventory

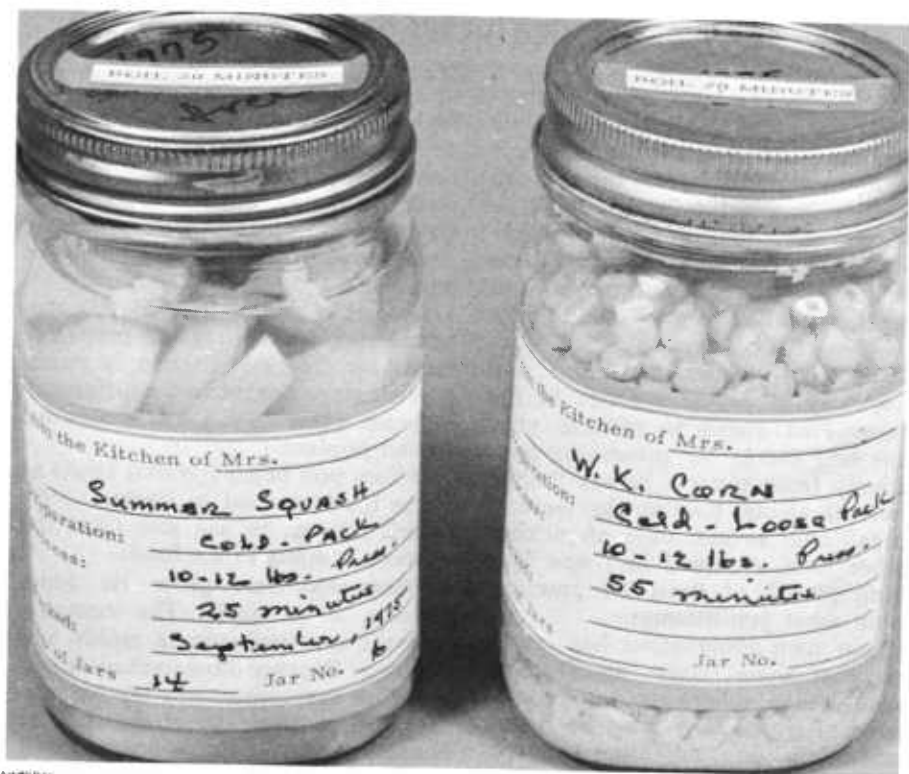
Write name of product and date canned on a gummed label or the lid of each jar with a felt tip pen. Keep a record of food canned, date, number of quarts or pints, and a place for you to check them off as you use them. This can be your guide for next year's preservation plan. Use food preserved for the current year, readying a storage place for next season's garden produce.

Canned foods stored in a dry, dark, cool temperature (70° F or below) will retain good eating quality for a year. Home canned foods stored in a warm place near direct sunlight, hot pipes, above a range or refrigerator, or in kitchen cabinets may lose some eating quality within a few weeks. Dampness may corrode lids and cause leakage so that the food spoils.

The main cause of spoilage in canned foods is improper processing. Bulging jar lids, or a leak, may mean gas is present and the food spoiled.

Before opening home canned foods, wash jars and lids and carefully inspect the jars. Bacteria, yeasts and molds should have been destroyed if the food was properly processed.

When you open the container, look for such danger signs as spurting, cloudy or frothy liquid, an "off" odor, deterioration, or slimy texture. A foamy or murky appearance and patches of mold are visible signs of



Art Walker

ALWAYS label home-canned foods.

spoilage. That ordinary looking mold on home-canned food may indicate the presence of a much more deadly problem: botulism.

The odor in good jars of food should be pleasant and characteristic of the product. Do not use food which looks or smells bad, or if there is any doubt as to its safety.

Destroy food if any of these signs are obvious; discard out of reach of humans and animals.

All low-acid, home-canned food should be boiled 10 to 20 minutes to insure destruction of botulism-causing

toxin for added safety. Heating denatures the toxin so that it does not react with the body. Never taste home canned food before cooking it.

Successful results largely depend upon the accuracy with which up-to-date directions are followed.

Safety is best assured when you exercise special care as you prepare and pack food into canning jars, fitting jars with properly pretreated lids, and heating jars of food to a high enough temperature for a sufficient length of time to kill micro-organisms that cause spoilage.